CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

1. A method for detecting and correcting for modal dispersion in a multi-mode fiber optic system having an optical signal coupled into a multi-mode fiber, comprising:

detecting a plurality of optical signals radiating from an end of the multi-mode fiber by a multisegment photodetector having different detector regions that detect different portions of the plurality of optical signals; and

modifying detected signals by the multisegment photodetector to reduce effects of modal dispersion among the plurality of optical signals.

2. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed using weighting factors that adjust the detected signals.

3. The method of claim 1, further comprising converting the plurality of optical signals into at least two electrical signals and modifying at least one signal by weighting factors to produce a signal that approximates a value of the optical signal originally coupled into the multi-mode fiber.

4. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed by altering bias among the multiple detection regions as the weighting factor.

5. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed using attenuation as the weighting factor.

6. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed using amplification as the weighting factor.

7. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed using phase shifting as the weighting factor.

8. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed using delay as the weighting factor.

9. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector is performed by arbitrarily selecting the weighting factors.

10. The method of claim 1, wherein the modifying detected signals by the multisegment photodetector further comprises examining an output of the multi-segment photodetector and adjusting a weighting factor until the output approximates a value of the optical signal.

11. The method of claim 3, further comprises combining at least two signals modified together in unique manners to produce an output signal.

12. The method of claim 1, wherein detecting a plurality of optical signals radiating from an end of the multi-mode fiber by a multi-segment photodetector is performed using the multisegment photodetector having at least two concentric, coplanar, annular photodetectors.

13. The method of claim 1, wherein detecting a plurality of optical signals radiating from an end of the multi-mode fiber further comprises inserting a diffractive optical element between the fiber and the multisegment photodetector for modifying the distribution of optical signals among the plurality of detection regions.

14. The method of claim 1, wherein the detecting a plurality of optical signals radiating from an end of the multi-mode fiber further comprises inserting a reflective optical elements between the fiber and the multisegment photodetector to modify the distribution of optical signals among the plurality of detection regions.

15. A method for detection and compensation of multimodes produced from a multimode optical fiber system, comprising:

converting an input electrical signal to an optical signal;

launching an optical signal into a multimode fiber;

positioning a photodetection system at an end of the multimode fiber to receive a plurality of optical signals exiting the multimode fiber; detecting the multiple optical signals by multiple detectors of the photodetection system producing detected electrical signals;

modifying the detected electrical signals; and

adding together the detected electrical signals to generate an output electrical signal corresponding to the input electrical signal.

16. The method of claim 15, further comprising: transmitting the optical signal using an optical source selected from the group consisting of VCSEL, LED, DFB, and F-P lasers.

17. The method of claim 16, wherein the transmitting comprises transmitting the optical signal by direct modulation.

18. The method of claim 16, wherein the transmitting comprises transmitting the optical signal by indirect modulation.

19. The method of claim 15, further comprising boosting of the optical signal using optical amplification in any part of the multimode optical fiber system.

20. The method of claim 15, further comprising transmitting the optical signal at any combination of wavelengths selected from the group consisting of 850, 1300, and 1550 nm and neighboring wavelengths.

21. The method of claim 15, further comprising inserting an intervening optical element between the fiber and photodetection system to alter the distribution optical light to the plurality of detection zones.

22. The method of claim 15, wherein modifying the detected optical signals further comprises introducing a delay to any of the detected optical signals.

23. The method of claim 15, wherein modifying the detected optical signals further comprises attenuating any of the detected optical signals.

24. The method of claim 15, wherein modifying the detected optical signals further comprises biasing any of the detected optical signals.

25. The method of claim 15, wherein modifying the detected optical signals further comprises amplifying any of the detected optical signals.

26. The method of claim 15, wherein modifying the detected optical signals further comprises phase shifting any of the detected optical signals.

27. The method of claim 15, wherein modifying the detected optical signals is performed using instruments selected from the group consisting of electronic, semiconductor and mechanically based instruments.

28. A method for detecting and correcting for dispersion in an optical fiber system, comprising:

detecting optical signals radiating from an end of an optical fiber by a multisegment photodetector having a plurality of detection zones for detecting the optical signals, the detection zones positioned adjacent to one another and arranged in a coplanar, annular configuration.

29. The method of claim 28, further comprising modifying detected signals to reduce effects of the dispersion among the detected signals.

30. The method of claim 28, wherein detecting optical signals radiating from an end of an optical fiber is performed using a plurality of segments located within the detection zones having an interdigitated, planar metal-semiconductor-metal structure.